ABSTRACT OF THE DISCLOSURE

The metal complex-protein composite of the present invention includes a protein having a cavity and a metal complex and has a specific structure that the metal complex is received in the cavity of the protein. Here the metal complex is prepared by complexation of a metal ion, which is selected among the group consisting of rhodium, ruthenium, and palladium, with a ligand. The metal complex-protein composite of the invention functions as a hydrogenation catalyst of an olefin in water. The metal complex-protein composite is thus effectively applied to hydrogenation of water-soluble substrates and has environmental advantages over organic solvents.